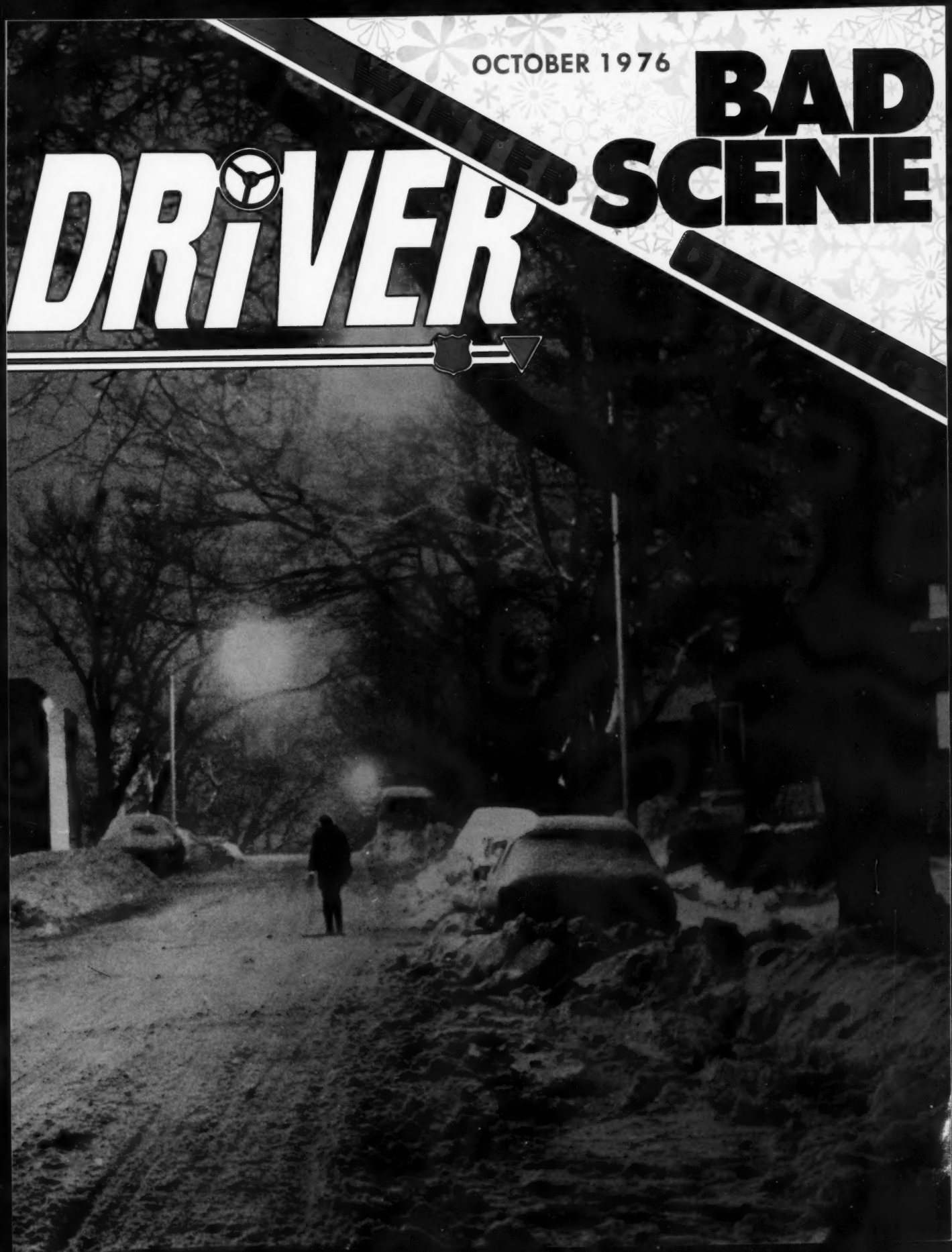

OCTOBER 1976
BAD SCENE
DRIVER

DRIVER

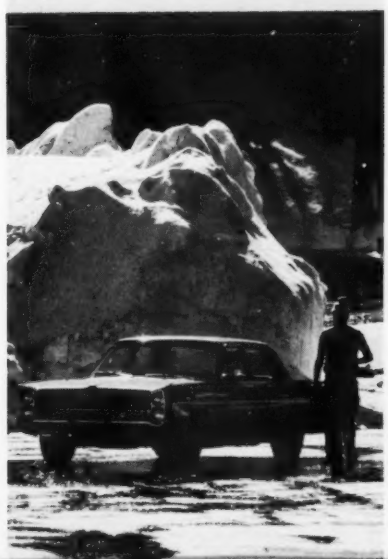
WINTER

Winter is a special time of the year, and as such there are special places to go, special things to do, and special things to keep in mind while you're getting there. Cold, demanding weather is as much a part of winter as bikinis are a part of summer. Both are difficult to ignore, so preparation should be taken lest you be caught off guard.

Long-time DRIVER readers have probably figured out by now that this is our annual installment and update on winter driving tips. But hold on there! Before you turn to the Backyard Mechanic, we'd like you to know there are a couple of new tips this year that

Just because your winter doesn't include a trip to the mountains, don't think you won't get a little snow—even in the city.

DRIVING



just might come in handy when you find yourself sliding headlong into a charging semi.

GET IN TUNE WITH WINTER

Tuning up is not just what you do to the radio when the guy next door starts singing in the shower, but it is one of the first winterizing precautions to invest a few bucks in.

Summer is long gone now, and with it the days when all you had to worry about was getting sunburned or where to spend Saturday night. But in the dead of winter when it's 0755 and you're due to report for work at 0800, starting and stalling are a couple of things you need to think about in advance. Avoid these hassles by investing in points, plugs, and the other goodies that go into a minor tune-up. Besides the few extra miles per gallon you'll probably coax out of your engine, a tune-up usually gives that extra power needed to get the old beast going on those sub-freezing mornings.

Good starts, though, begin with the battery. Be sure to get rid of all the junk and crud that builds up on terminals and cables, and wirebrush both to insure clean connections. Also see how the water levels are in each battery cell, and add distilled water to those that look thirsty.

(Things probably sound awfully familiar so far, but first things first.)

continued

DRIVER

THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

OCTOBER 1976

VOLUME 10 NUMBER 5

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THE EDITOR SPEAKS

DOUBLE CLUTCH

FUEL ECONOMY/CLEAN AIR CAN WE HAVE BOTH?

The 1908 Ransom Olds Runabout weighed 2,800 pounds, developed some 40 horsepower, and averaged about 13 miles on a gallon of gasoline. The 1976 Chevrolet Vega weighs almost exactly the same, develops nearly double the horsepower, and averages twice as many miles on a gallon of gasoline.

Using this comparison, a Chevrolet engineer recently emphasized that it has taken 70 years to double the average fuel economy. But he's not sure how much more can be achieved. "There are no magic carburetors. There are no magic gasoline pills. The laws of physics, chemistry, and thermodynamics have not been repealed," says Kenneth G. Hanson, a staff engineer at Chevrolet. "There is no magic way of improving fuel economy—period."

Mandatory fuel economy standards have recently been approved by the government: 18 mpg in 1978, 19 mpg in 1979, 20 mpg in 1980, and up to 27.5 mpg in 1985. Can the auto industry do it? They say the only way is to turn exclusively to small, lightweight cars. Yet the American public, after a brief romance with smaller cars during the fuel crisis, is turning back to the full-size vehicle. Greater safety of the larger car may be a consideration with many buyers.

Hanson credits improvement in fuel economy between 1974 and 1976 almost exclusively to the development of the catalytic converter. "Smaller cars, new and more economical engines, new high energy ignition, lower rear axle ratios, and widespread use of radial tires—all these things together probably would not have offset the continued decline in fuel economy," he said, "if it were not for the catalytic converter."

How about doing away with the internal combustion engine? The automotive people say there are many potential alternatives, but the internal-combustion engine will be the workhorse of the industry for at least five more years. The rotary engine, for instance, is compact, making it great for small vehicles. But it just cannot meet future federal emissions standards, even with the catalytic converter.

continued on page 27

Winter means special things to do, special places to go, and special things to keep in mind while you're getting there.

That's the idea, get out the old scraper and do a job on icy windows . . .

. . . but don't stop short! Peeping Tom drivers are asking for trouble with this little visibility.

continued

WINTER DRIVING

KEEPING THINGS COOL

We know that during the summer you always made sure to keep coolant in your radiator, but if you think that protection against boil-overs is all your cooling system is good for, you probably still think Peter is a rabbit, too.

The cooling system – with a 50/50 mix of anti-freeze and water – also keeps the radiator from freezing over in the winter, and protects against corrosion year-round. Most anti-freeze manufacturers recommend that coolant be replaced once a year because, while it will protect against freezing for many winters, it loses its anti-corrosion strength after about a year.

EXHAUST AND LUBRICATION

Since you'll probably be driving a lot with the windows up and the heater blasting away, you'll want to be sure that exhaust gases aren't entering the car. Rusty, cracking tailpipes and mufflers should be replaced, and always drive with the windows down about an inch for ventilation. If the exhaust is a borderline case, remember that winter means more water on the road and faster rotting and rusting of metal.

As long as the old jalopy is dangling atop the car hoist, ask your mechanic to give the chassis a good lube. The extra moisture present in winter is sure to get into the little places that cause all the squeaks you never seem to be able to find, but can always hear.

CHANGE THAT OIL: NEW TIP #1

One of the things people don't realize until the morning after it's been down to 10-below is that different weight motor oils are a must for different temperature regions. The most common type, for example, is 30-weight, and is fine for warm and mild areas. When it comes to the snow and cold of the mountains, 30-weight tends to solidify. It's easy to figure out that a different weight oil is called for, such as 10-weight or one of the new synthetic varieties (which, by the way, will be the subject of an upcoming DRIVER feature). These oils have very low viscosity and should keep your engine well lubricated all winter.

BRAKES

The cardinal rule of driving on ice has to do with brakes, but we'll get to that in a bit. As long as we're on the subject, though, we might as well point out that brakes are apt to be relied on more in the winter than any other time of the year. In plain English, you should have your brakes put into top working order *before* the first snowfall. While your brakes are being looked at, it would also be a good idea to have your mechanic give the front end an alignment. A car that grabs to either side when braking is only a nuisance on dry pavement, but on an invisible sheet of ice it means a quick 360 off the road.

PEEPING THOMASES

Playing the role of a peeping Tom will get you an expense-paid vacation in the local pokie if you do it in somebody's window, but with your own windshield it's a different story. When the temperature drops and the birds begin to head south, windows start to freeze up and make visibility almost

continued

Hard accelerations on snow and ice won't get you much more than spinning wheels and some great fish-tailing.

nil. Now, you can either clear a head-sized patch in that ice, take the extra time to scrape *all* of the ice off *all* the windows, or you can chuck the whole mess and call a taxi.

We strongly suggest the second option, since the last is too expensive and the first runs too strong a possibility of getting your nose frozen to the windshield while you're pressing against it to see out. Peephole driving will also get you into more trouble than just about anything else.

You should also replace your wiper blades and have the wiper motors checked unless they've been done recently. Hot summer days can dry and crack rubber blades into streaky uselessness, and long months of disuse can freeze up wiper motors.

Being seen by others is just as important as your being able to see them, so all your scraping will be for naught unless your lights work properly. Look behind lens covers for burned out or broken bulbs, and have your headlight adjustment looked at, too.

As long as you're poking around with the lights and such, be sure to check the fuse box. With extra stress on the electrical system that comes with winter driving, those two-bit little pieces of metal and glass will become even more important, and will have to work like the dickens to keep lights lit, heaters heating, and horns honking. To avoid getting marooned midway between "Where's that?" and "Never heard of it," take along a complete change of fuses.

BACK TO YOUR FIRST DATE

When it comes to starting, driving, and especially stopping on ice, it's a helpful idea to keep your first date in mind.

If you recall, you didn't really know what to expect, so you were slow and cautious, taking time to examine the situation and carefully weigh what to say and how to behave. You figured it was a good idea to act smooth, because otherwise you'd only spin your wheels and get nowhere. Driving on ice calls for the same caution and thinking.

Remember how, once you did get going (you did, didn't you?), it felt pretty good, but you had no idea what was just up the road. So you kept your speed down and watched for obstacles up ahead. Be just as speed-conscious and wary on winter roads.

Remember, too, that after things had been going smoothly for a while, you decided to get aggressive and make your first move. You knew that if you moved too fast or hard you were likely to wind up alone and embarrassed – probably off on the side of the road. So you moved with finesse and grace, making sure to avoid herky-jerky movements. Your motions with the wheel should be just as graceful when you're driving on ice.

And lastly, if you found you had made a mistake, had come up against an obstacle, or had gotten into something you wished you hadn't, it was time to stop. Common sense and hormones probably told you not to lock up and make a panic skid, because it would only compound problems and make you feel like a fool. Use the same common sense when it comes to stopping on ice, or even pulling into a parking space.

All movements in a vehicle traveling on ice, snow, or water should be made with care and delicacy, especially when it comes to braking. Tests under winter conditions show time after time that stopping distances are from three to 12 times longer than on dry pavement. Keep this in mind if you have a tendency to speed or tailgate, or if some knucklehead insists on sitting on your tail. Keep a slower overall speed, begin to slow down far in advance of normal, and let a tailgater pass you if he won't back off.

When you're out on the road, and it appears that the ice has melted, be sure to keep an eyeball peeled for patches of "black ice." The most frequent culprits in this category are bridges, underpasses, and portions of highway that have been shaded by trees, signs, road embankments, buildings, and anything else capable of casting a large shadow.

When you approach these patches, your first instinct will probably be to speed up and zip across them, but don't make that mistake. Instead, the best action to take is removing your foot from the gas pedal and allowing the car to coast across. You can begin to speed up once you're safely through.

If worse should come to worst and you find yourself in a slide, the following tips could keep you from hitting that semi.

ON THE SKIDS

1. Don't panic. Keep calm and under control.

2. SLOWLY remove your foot from the gas pedal. Don't jerk it off.

3. Don't hit the brakes hard or fast, but pump them sparingly and with short, light touches.

4. Keep the car in gear. This helps reduce speed via engine compression, and results in greater vehicle control.

5. Turn the wheels in the direction that the rearend is moving. If the car is sliding to the left, turn to the left, etc. But only steer gently, don't jerk or whip the wheel, it'll only make matters worse. (If a counter skid should occur, simply repeat the process for the original skid. This counter skid business could happen several times, and calls for real heads-up action, but that's what defensive driving is all about. Right?)

6. As soon as you feel the car coming out of the skid, straighten out the wheels and roll for a short distance before using the gas.

NEW TIP #2

We promised you a new tip on winter driving and here it is. The tip has to do with skid procedures for front-wheel drive (FWD) vehicles. Some cars such as the Olds Toronado, Cadillac Eldorado, Hondas, many of the new Volkswagens, Audi, Saab, Fiat 128, and others are FWD, and call for different skid procedures.

continued

If you move too hard or fast, you're apt to wind up off to the side of the road.

Stopping distances are from three to 12 times longer on ice and snow, but can be shorter if you're tailgating.

Be wary of sections of road that may be shaded by trees, signs, and other roadside objects.

Unlike most cars which are engine-braked at the rear wheels, FWD vehicles are engine-braked at the front. This action causes the front of the car to slow down, while the rearend maintains its speed and "outruns" the front, causing spinouts.

The correction for a FWD slide is this: don't decelerate. The best thing to do, if there is time and room, is to speed up slightly while turning the wheel in the direction of the slide. The next best thing to do – but far less effective – is to dump the clutch in, or take the transmission out of gear. While it won't get the front end going faster than the rear, it won't make it slow down any more, either. This second option is also cautioned because of the possibility that Reverse, Park, or Low could accidentally be found while groping for Neutral.

WARMING UP, AND BACK TO THE FIRST DATE

The question of letting the engine warm up before pulling onto the road versus just starting up and going is a little like trying to decide to kiss on the first date: There are pros and cons.

We feel that warming up first is the best policy, and for several reasons. Firstly, allowing a cold motor to warm up will do away with having to goose the gas pedal to avoid stalls out on the road. And as we said earlier, quick accelerations on icy roads are a no-no. Secondly, while the engine's warming up, you can have the heater/defroster going, so you won't have to worry about being a peeping Tom. While it's true that warming up does zilch for fuel economy, at least you won't have to worry about incomplete combustion problems that come with driving a cold engine: such as unburned gas getting in the oil, and the rotten valve and bearing lubrication that often results. Besides, what's more important, a fast start or a safe trip?

RETREADING THE TIRE DEBATE

Sooner or later, most any discussion on winter driving will get around to the debate of snow tires vs. radials – steel or otherwise. We aren't going to stick our necks and noses into the mess, but here's what some other informed sources have to say:

Firestone Rubber Co.: "Radials give good traction, but they're not snow tires."

Mechanix Illustrated Magazine: "There's no doubt about it that the best tires for traction in ice and snow, other than chains, are studded snows."

General Motors: "Snow tires offer marginal help under certain conditions – loose snow, for example – but they're not magic and they're no help at all on ice."

National Safety Council: "Although their efficiency drops as they wear down, studded tires provide more traction on ice than anything except reinforced chains."

Well, they all seem to be leading up to the same conclusion: that for the very best control in snow and ice, reinforced tire chains are tops. The rest of the list, in order of descending preference is: studded snows, snow tires, radials, regular cord tires. Another thing they all agreed upon was that the trick of deflating tires for better traction does *nothing* but waste time and wear tires out faster.

Whatever type of tire you decide on, though, the old rule of putting the best tires on the drive wheels should hold true. Therefore, if your car is rear-wheel drive, the snow tires go in the back. Owners of FWD vehicles, of course, should put the best rubber in the front. You'll probably be using only two snow tires – most U.S. drivers do – but bear in mind that snow tires all around will do a better job.

One last reminder concerning snow tires: because of the added damage they do to highways, snow tires are restricted by many states to only certain months of the year. A few states and some parts of Canada, in fact, ban their use entirely. Be sure to check with your local police to find out what category your area falls into.

About the only thing left to be said is that for added peace of mind winter drivers should carry emergency road equipment, such as a small bag of sand, a shovel, traction mats, and chains to fit your tires.

Well, that's all for another year, so you can go ahead and check out the Backyard Mechanic, but we'll see you back here before the snow flies in '78.

You'll probably only be using two snow tires, but bear in mind that four will do a better job than a pair.

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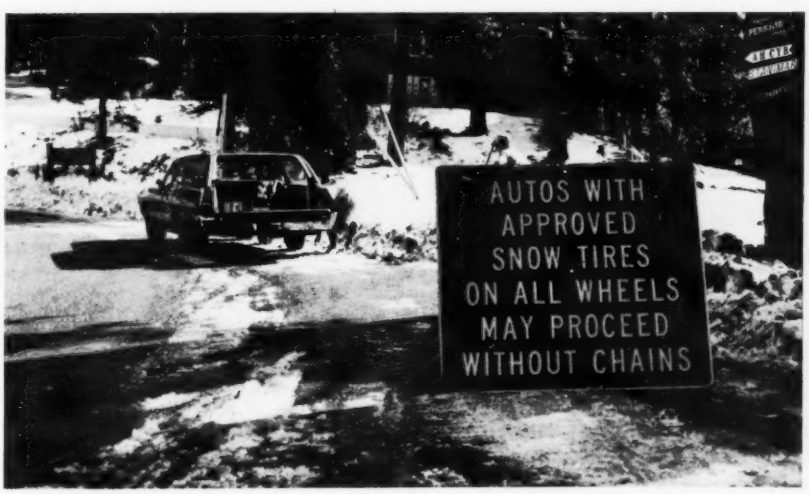

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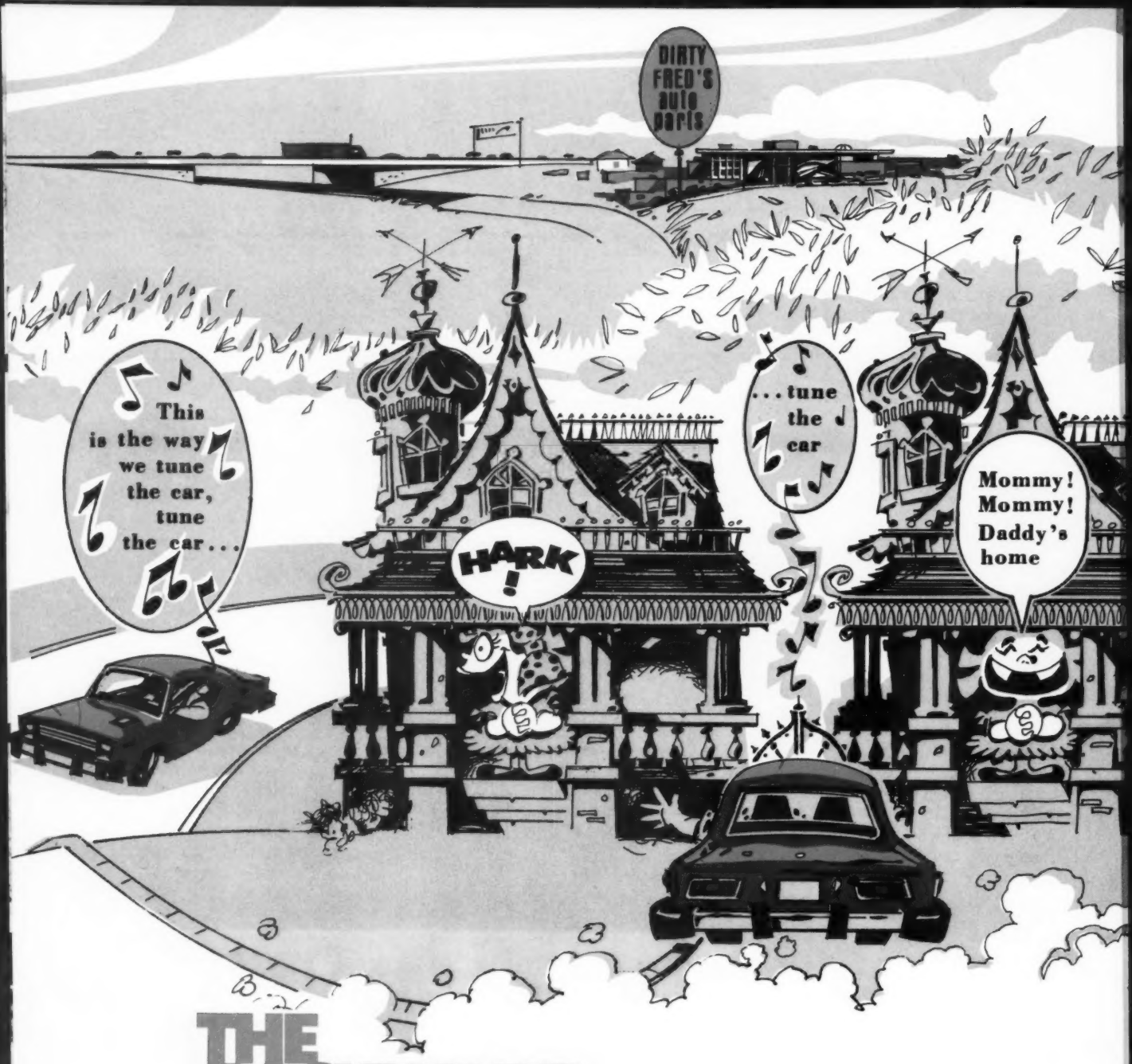


THE BACKWARD MECHANIC on tuneups

by STANLEY R. DOERING, JR.
USAF Security Services / AFCD
Kelly AFB, TX

Mommy, Mommy, why is Daddy blowing his cool?
early on Saturday morn-ning
...this is the way we tune the car
...home from DIRTY FRED'S
DAD BURN the CARN-SARN!!
CUSS CUSS CUSS CUSS
KELLEHER

Does this sound like someone you know?

If you don't count the time I installed the carburetor backwards and couldn't figure out how to hook up the throttle linkage, I'm a pretty fair backyard mechanic. My wife doesn't think so, but of course her sense of humor is pretty far out. For instance, when I announced the other day that I was going to tune up the family car, she ran to the drugstore and bought bandages, iodine, and ear plugs. I went along with her little joke until she called the local blood bank and asked them to lay in a stock of A$^{1}_{2}$-positive . . . hoo boy, is that woman subtle!

Anyway, Saturday morning dawned clear and warm, and I trucked on down to Dirty Fred's place and got plugs, points, rotor and condenser for the ol' bus.

Arriving at the hacienda, I opened the hood, ready to change those filthy old spark plugs, and discovered that this '76 of mine is a *little* different than the '55 I traded in. Instead of an engine, all you can see are pumps, compressors, belts, hoses, alternators, power brake stuff, wires, and an air cleaner that looks big enough to replace the manhole covers down on Main Street. Then I got a really *big* shock . . . I can see it all now: two guys in Detroit stand at one end of an assembly line and place 8 spark plugs on an orange crate; the orange crate moves down the assembly line and other people build the car around it. There just isn't any other way those plugs could have been installed.

"Well," says I, "if they went in, they gotta come out." A good thought, but not necessarily so. At this point, I discovered that if you rest your hand or arm against an exhaust manifold, you will smoke-check your hand or arm.

continued

My wife, wonderful soul that she is, put in her ear plugs and doused my singed limb with burn ointment. She didn't say a word, but that silly grin still drives me crazy.

Since I ain't no dummy, I decided to mow the lawn while the car cooled down. Now, my lawn mower is a peculiar beast, requiring twelve cranks and three kicks to fire it up. I think I've got a handle on the situation, but my neighbor says the mower needs a tune-up too. I know better; I've only had it for three years.

I was just about done with the yard when a loud noise from under the mower caught my attention. Sonovagun, so this is where I lost my good screwdriver! Have to speak to that kid of mine . . . always leavin' things around. Oh well, no problem really; I'll just wait 'til after dark to retrieve the screwdriver blade from the neighbor's garage door.

I removed the spark plug lead from the mower's plug (I'm real safety conscious ya know) and turned the critter over to see what else happened. Only half the mower blade was gone, but it was the sharp half. I dinged up the other side last week. I guessed I'd find it eventually.

@#$%¢&* PLUGS

Have you ever noticed that after a tune-up the mechanic always refers to the spark plugs as "those @#$%¢&* plugs?" Not "those Autolite plugs" or "those Champion plugs" or AC, or Bosch, etc., just "those @#$%¢&* plugs." Now I know why. One through three came out beautifully, but that number four . . . I figured that if I got some leverage, it'd come out OK, so I climbed up on the fender and rested one foot on the firewall and the other against the radiator. The plug popped loose nicely; unfortunately, so did my foot. It didn't really hurt, but I got my nose dirty on the air filter and my wife gave me that same silly grin when she pulled my foot out of the fan belt.

As I went around to the other side, I put the ratchet handle down. Since I'm safety conscious, I had disconnected the battery, but unfortunately, I removed the positive lead, not the ground, so when the ratchet contacted the hot post and the fan housing, there was an alarming amount of sparks. I fooled everybody though, and didn't bump my head on the hood when I jumped back. The battery didn't blow up, and I only had two little black marks on the ratchet . . . no problem.

I knew that if I was gonna get out the plug next to the firewall, I'd have to use my special tools . . . one 2″ and one 6″ extension, with a universal joint in the middle. If I just had an extra joint between my wrist and my elbow, I'd be in "fat city."

To make a long story short, the wrench slipped.

Hoo boy, I just hate pain! And I really didn't care to see my own life's blood leaving my knuckles so profusely, either.

The wife was just putting in her ear plugs as I entered the house, and I could distinctly hear her say, "If you think you got troubles now, just go ahead and bleed on my new rug . . . you'll wish you'd stepped on Superman's cape instead."

It was at this point that the dumb dog (the one *I* didn't want) became flustered because of my fast pace, and ran right in front of me. Just because I'm in a rush, dumb dog thinks he's gotta run too, so we both wind up in a heap on top of the remains of the coffee table. I never did figure out why the dog howled, because *he* was on top of *me*, but my wife tosses me the iodine bottle and runs over to hug Spot. "How could you be so cruel?" she asked, glaring in my direction. I didn't answer because she still had her ear plugs in and the effect would have been wasted.

FLUMMP, ZAP, ETC.

I wanted to finish the tune-up before my hand became too stiff, so I pressed on. The other plugs came out OK (naturally) and I only had two plug wires I wasn't sure about. The points were easy, because long ago I found out you will *always* drop one of those tiny screws down under the distributor plate, and I keep a skinny stick with an attached magnet handy.

With the new rotor and condenser installed, I ran around to start 'er up. It only backfired twice before it went FLUMMP and flames leaped from the carburetor. For a moment, I kinda wished I'd gone to that fire extinguisher sale last week, but since hindsight wasn't helping with the fire, I looked around for a means of putting it out.

I consider myself quite able to cope with emergencies, so it will come as no surprise to you that I quickly grabbed a wet sheet off the clothesline and effectively smothered the fire. I really pride myself on the fact that not only did I put out the fire, but I managed to blame the ruined sheet on the dumb dog. Justice . . . I love it.

I put the air cleaner back on (where, I will admit, it should have been in the first place) and started 'er up again. It still ran a little raggedy so I knew I should switch those two spark plug leads.

You know, "ZAP" isn't just a thing cartoonists do to show electricity. It's exactly the sound you hear when you touch a spark plug on a running car. Another interesting thing about touching those plugs is that all those little volts tend to throw your body about with a good deal of energy. Actually, what I mean to say is that I whacked my head on the hood, and my elbow on the fender.

Since the dumb dog wasn't hurt, my wife helped me bandage the small dent

in my noggin. She's a nice lady, but if I see that silly grin one more time, she'd better watch out in dark alleys.

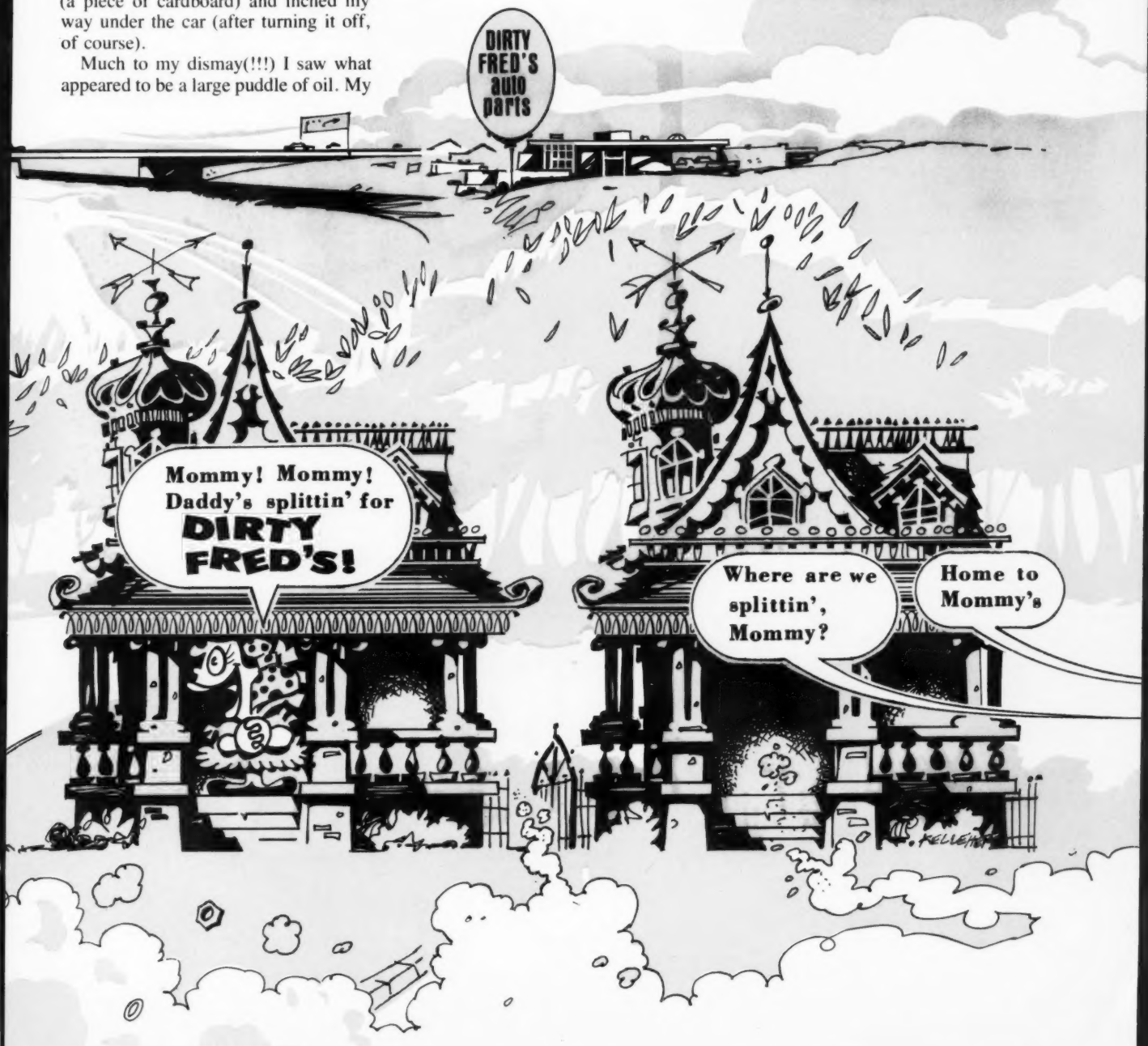
AT LAST

I turned off the car and swapped the crossed plug wires. Worked like a champ . . . car ran nicely. *Then* I noticed that the red "Oil Low" light was on.

I couldn't figure out why it was on, because I had checked the oil when I bought the car only six months before, so I pulled out my poor-man's creeper (a piece of cardboard) and inched my way under the car (after turning it off, of course).

Much to my dismay(!!!) I saw what appeared to be a large puddle of oil. My senses are pretty keen, and I was right . . . it *was* oil! Where did it come from? Well, just let me say that in three lifetimes I'll never figure out *how* that mower blade managed to puncture that steel oil pan.

I really don't feel too bad, though. After all, I can just drop on by Dirty Fred's and pick up a used oil pan, and, after all, it *is* my *wife's* car, not mine (heh-heh). I'll just take the ol' pickup to work tomorrow. Of course, it *does* need new shocks, and I've got a little spare time, so why don't I just . . .



unbuckling the seat belt MYSTERY

Judging by the number of letters DRIVER receives concerning seat belts, we tend to get the impression some people really do give a darn about 'em. After all, the U.S. Department of Transportation (DOT) has reported for the last few years that only about 30% of all U.S. drivers and passengers use their seat belts. This in itself is a tragedy, as DOT religiously advises us that traffic fatalities could be cut by at least 12,000 each year if *all* drivers and passengers wore seat belts.

In any event, after several "How do seat belts work?" letters, we got to wondering ourselves and decided it was high time to find out. What we especially wanted to know—along with our letter writers—is how the contraptions in the newer cars let you move freely about, but lock up tight in case of a crash.

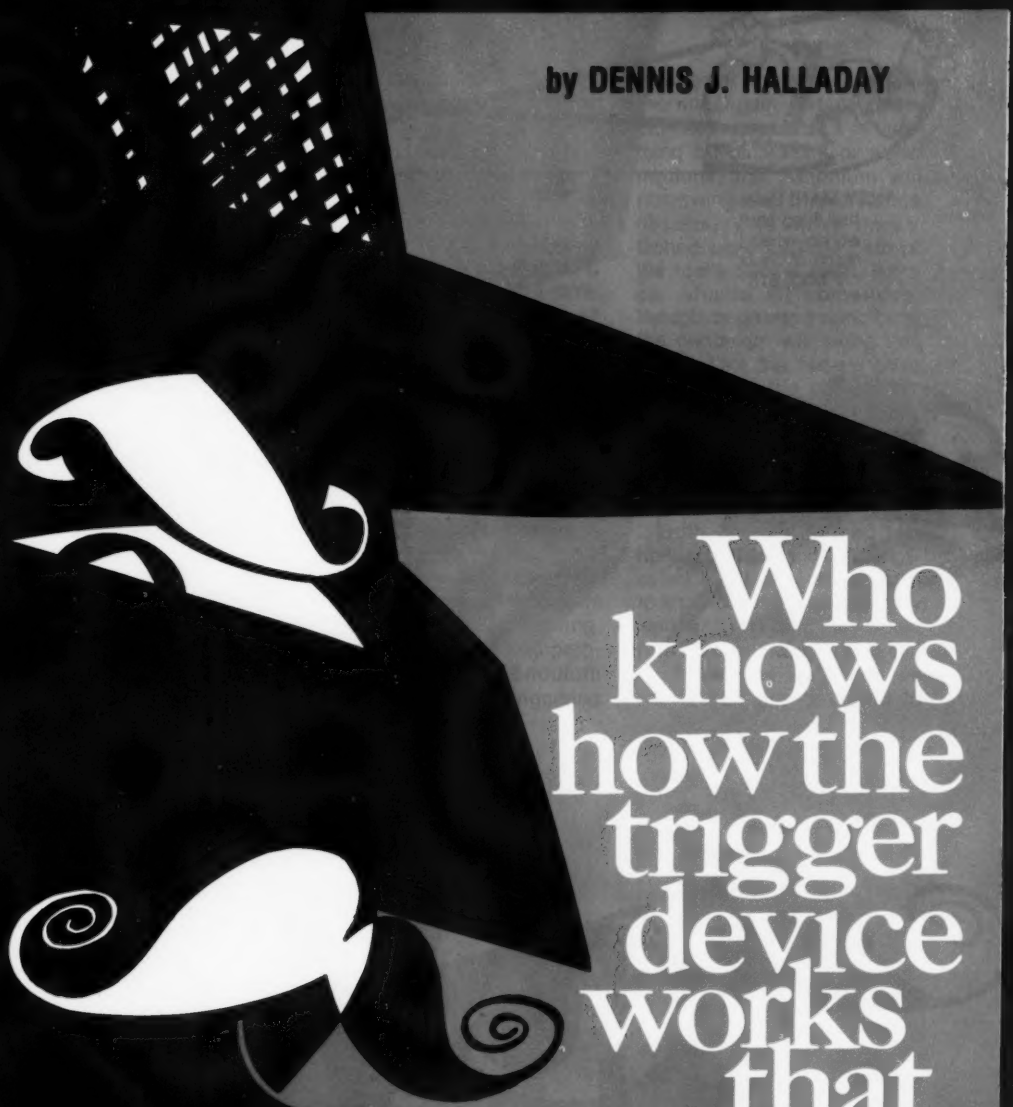
For the answers on this and other safety restraint questions, DRIVER went to American Safety Equipment Corporation, and visited their engineering and testing office in San Fernando, Calif. We not only saw how seat belts are put together and work, but also observed first-hand the incredibly rigorous testing that each of its parts must endure before the design is accepted for production. We hope the answers interest you as much as they did us, and maybe we'll get some of you non-belt users to stop playing with your life expectancy.

Herein lies our main question: How do those new seat belts let you move around, but lock up tight in a collision?

The first thing we learned at American Safety was that seat belts are only a part of the restraint systems family. While belts are the most widely used form of restraint, devices such as shoulder belts, air bags and head restraints are on the list, too. And just so we don't get letters, we'll explain right now what the difference is between a "passive" restraint system and a nonpassive system:

A passive restraint system is one that does not have to be buckled, adjusted, or otherwise fussed with—without use of hands is a good synonym. A prime example would be the air bag. All you have to do to be protected is be in the front seat; it comes into

by DENNIS J. HALLADAY



Who knows how the trigger device works that dwells in the heart of the restraint system?

The SHADOW do. And so will you when you've finished reading this article.

play automatically. Another more widely used passive restraint is the lap/shoulder belt combination that the wearer "steps into." These systems are not only anchored to the floor and roof, but are also bolted to the door, so that when a person seated inside closes the door, the whole works close on top of him. He doesn't have to fuss with buckles, straps and whatnot, but simply drives off.

Rather than thrash our way through nonretractable lap belts and the rest of vehicle restraint systems history, we'll get right to the matter of present day models. Most of our seat belt letter writers tell us that they figure there is some little device in the belt mechanism that lets them move around slowly, but which triggers the belt to lock up in a crash. Well, they've hit the matter right on the head.

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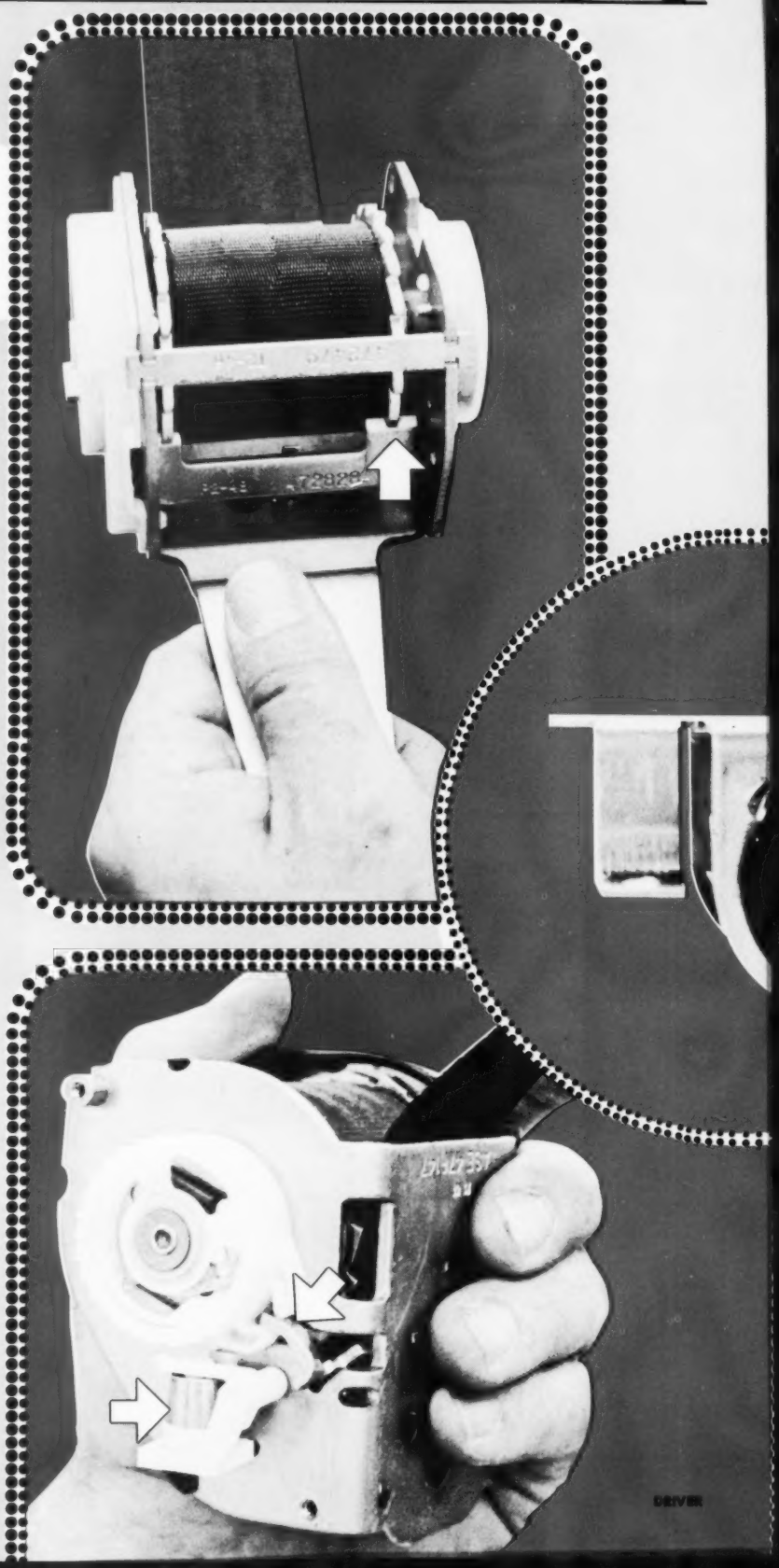
"**HEY MAN!** Does this thing start workin' when I reach .7 Gs or **7 MILES!?**"



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UNBUCKLING THE SEAT BELT MYSTERY

Hans Jakob, American Safety's chief test engineer, showed us that there are two such devices presently on the market that allow wearer movement, and both are sensitivity-triggered devices.

The first, called a belt-sensitive reel device, comes into play depending on the acceleration of the belt as it is played out from the reel. You may or may not know that in an accident, the first direction a person's body moves is toward the impacting object. Since the vast majority of auto collisions are of the frontal variety, a person's first line of movement is toward the windshield. This action causes the excess webbing rolled up on the reel to be pulled out at a speed equal to that of the wearer. As long as the wearer confines himself to slow, easy motions he won't trigger the locking device. But if the speed of webbing leaving the reel reaches .7 G, the centrifugal force that results will throw a small metal bar into the reel's rachet teeth, thus instantly stopping the out-playing of webbing. The time between vehicle impact and belt locking is not more than five one-thousandths of a second, so you don't have to worry about going through the windshield before the belt locks up.

Device number two is called vehicle-sensitive, and works on basically the same principle except that the triggering mechanism works on the car's rate of deceleration. As you may have gathered from above, when a car hits something, or is hit, whatever is inside will keep on moving. With this in mind, you'll probably see why a pendulum would be an ideal triggering device for the vehicle-sensitive unit. Again, as long as the car stops and starts in anything but jackrabbit or panic motions, the pendulum will not swing the tiny distance necessary to move its attached plate into the path of the reel's ratchet teeth. If the car should hit something, though, or go into a panic stop, the pendulum will swing into action. Like the belt-sensitive mechanism, the vehicle-activated unit takes not more than five one-thousandths of a second from the moment of impact to the locking of the belt's reel.

Both devices looked terribly simplistic and uncomplicated, so we of course wanted to know how dependable they were and how long they would last. The answers impressed us, to say the least, and we reaffirmed our devotion to

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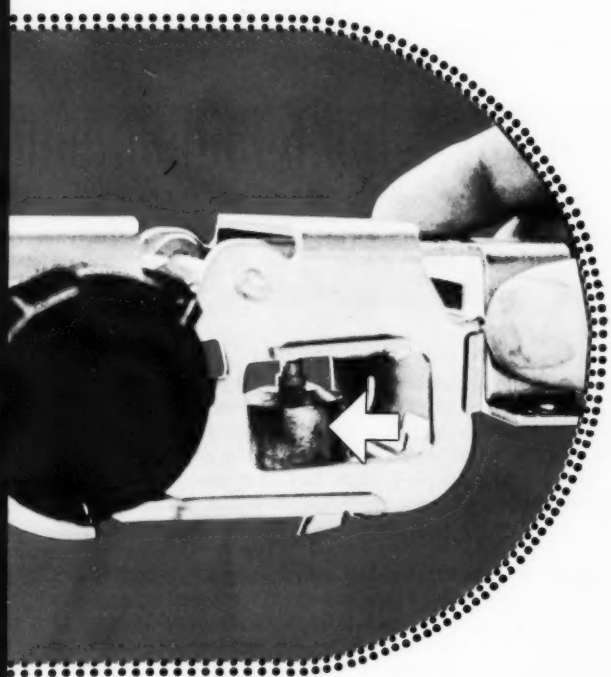
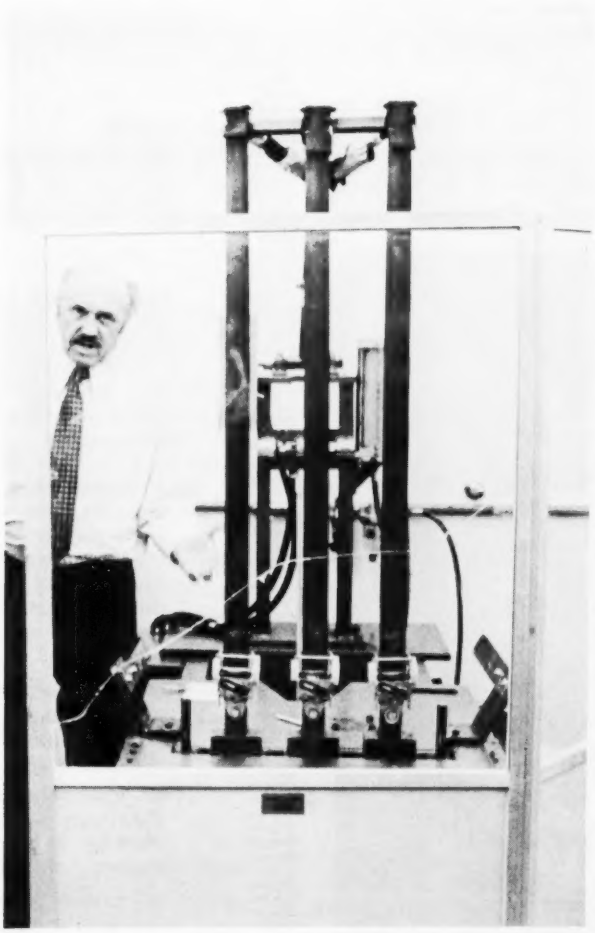
(left)
Answer number one is the belt-sensitive reel unit. The little bar (see arrow) blocks the reel's ratchet teeth when the belt plays out too fast.



(above)
Answer number two is the vehicle-sensitive device. If the car starts or stops too abruptly, the little pendulum (see arrow) swings and causes a hinged plate to block the ratchet teeth.

(left)
For the best of both devices, there is even a unit that uses a pendulum (left arrow), and a centrifugal force throw-out mechanism (right arrow).

(right)
To test belt and reel cycle life, American Safety uses this device to reel and unreel three belts at once up to 50,000 times each.



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UNBUCKLING THE SEAT BELT MYSTERY

To make sure mounting bolts won't pull out during a collision, they are subjected to tensile pull resistance.

This is the usual result when a bolt undergoes 8700 pounds of tensile pull.

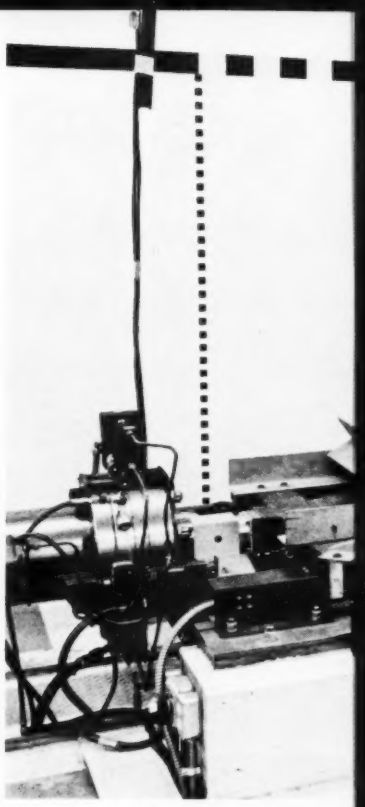
seat belts when we saw the severity and thoroughness of tests they are put through.

The belt webbing turned out to undergo the most tests, beginning with a 24-hour stay in a high-density dust chamber. It then spends an equal amount of time in a salt air chamber, and then 12 hours each in 176-degree heat and 40-below zero cold chambers. After these tests are passed satisfactorily, the same belts and reel units are tested for cycle life. In this test, several belt/reel units are attached to a long bar, which pulls the belts out to their full length before allowing the reels to fully retract the belts. This cycle is repeated 50,000 times —the minimum life mandated under DOT regulations.

For a better idea of what 50,000 cycles means, you would have to buckle and unbuckle your belt 10 times a day, every day, for more than 13 years to reach as many cycles. But this doesn't mean that the belt wears out at cycle 50,001, it's only the *minimum* number it must last.

Next, we observed the buckle and metal tongue tests for tensile pull strength. What this means is that when buckled, the combination must be able to resist a straight pull equal to at least 2500 pounds. This 2500-pound minimum will appease DOT, but not the Detroit automakers, who have taken an uncommon step forward by setting their own minimum standard of 3300 pounds.

Everything looked very impressive to us up to this juncture, but we still wondered what the chances were of the seat belt mounting brackets and bolts pulling out during a collision. "Almost nil," Jakob said firmly. He reminded us that while the buckle/tongue combination is required to take "only" 3300 pounds of tensile pull, a single mounting



ExcusExcuses

People say the darndest things when they're talking about seat belts. More often than not, the discussion is apt to kick up a flurry of "logical" reasons for not wearing them. But logic has little to do with them; most are just cover-ups for pigheadedness.

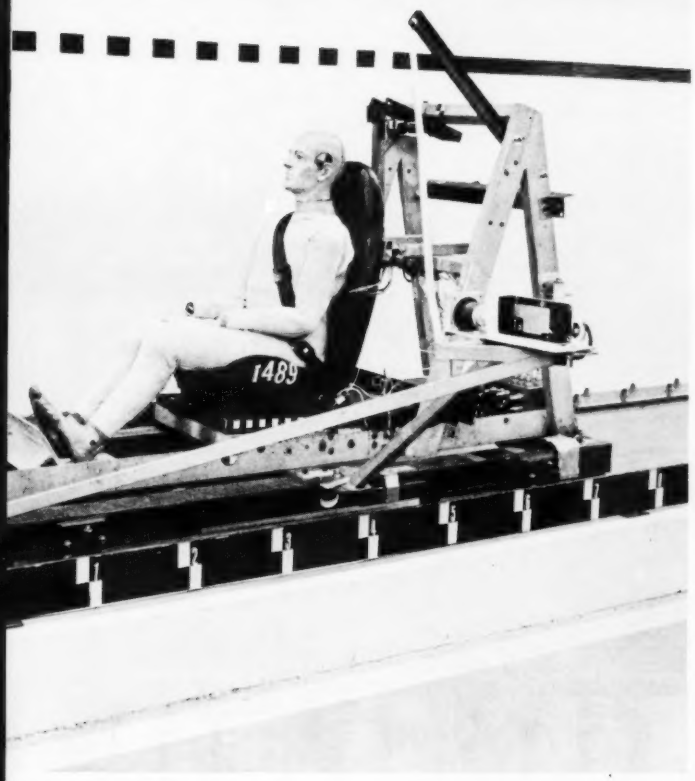
As a staunch advocate for the use of belts, DRIVER has heard dozens of alibis, and we thought we'd share some with you. You might find your own excuse here, or you might have a different one, but in either case, please read the real "logic" that follows each.

■ **"Seat belts are uncomfortable and restrictive."** It's a fact, they are restrictive, but that's what they were designed for. They were *made* to keep drivers and passengers away from steering wheels, steering columns, dash boards, windshields, and other "hostile surfaces." In regards to comfort, seat belts have the opposite effect if worn properly (over the hips, not the stomach or soft part of the abdomen.) They can reduce driving fatigue by keeping the driver in place, so he doesn't have to keep readjusting his seating position or brace himself for turns on mountain roads and curvy stretches of highway.

■ **"They wrinkle my clothing."** This has got to be the all-time cheap excuse. Yes, they do wrinkle your clothes, but we didn't know taffeta was so popular today. Think about it; aren't a pair of wrinkled Levis better than maybe getting killed if some drunk hits you?

■ **"Seat belts themselves cause injuries, so what's the point of wearing them?"** If anybody gets hurt because of belts, it's either because they're wearing them incorrectly, or because the accident was so bad that they would have been killed, or close to it, if they hadn't worn them.

■ **"I never drive fast, so I don't need seat belts."** A 1975 report by the National Safety Council stated that "Low speeds account for over half the deaths and two-



bolt rarely ever withstands less than 8000 pounds in tests, and most finally break around 8700.

American Safety is required to perform this series of tests on a certain percentage of each batch of belts they produce. In addition to their own testing, we were also told that duplicate tests are performed by an independent testing firm, then repeated by the individual automaker, and finally, DOT makes occasional batch tests of its own. It all had the slight air of an effort in futility, considering that 30% use figure.

In addition to all the other tests, seat belts are also sled-tested, using actual belts, car seats, common vehicle speeds, and dummies weighting up to 220 pounds.

But as Jakob explained, the tests are necessary. "Because of mass production, we have to maintain very tough quality control. Requirements on belt systems are much stiffer than for cars. If they (DOT) put the same requirements on everything in the car, it would go forever."

From webbing to mounting hardwear, seat belts go through the most rigorous of testing and safety checks. It often takes up to a year or more to conceive, design, construct, test, and market a new safety restraint design. This doesn't even include the thousands of dollars spent along the way. It's a shame then, that about 70% of most seat belts in the U.S. are going to spend the bulk of their lives stuffed behind a car seat, or ignored on the roof. They are guaranteed not to do any good in such positions, but try to tell that to Mr. "It won't happen to me."

thirds of the injuries from automobile accidents." The speeds they were talking about, by the way, were up to 30 miles per hour. The report further stated, in fact, that "Fatalities for nonbelted passengers occurred starting at 12 mph."

Excuses Excuses

■ **"I never drive far from home, so I don't need seat belts."** According to the Department of Transportation, National Safety Council, and other safety groups, most accidents occur within 25 miles of where those involved live. And consider this: Just how much of *your* driving is done more than 25 miles away from your home?

■ **"But I don't drive on the freeways."** For openers, NSC and DOT have both said that a driver runs the greatest risk of an accident on roads with intersections. More than half of all collisions, in fact, happen on surface streets. And if freeways are so unsafe, then why do both agencies recommend them to lower your chances for an accident?

■ **"Putting on a seat belt says to others that I'm not confident and expect to have an accident."** This reasoning is also popular with people who don't carry auto insurance. You might not expect to have an accident, but you don't want to trust the rest of the driving world, do you? Besides, you may not get a second chance if you're not buckled up in your first accident.

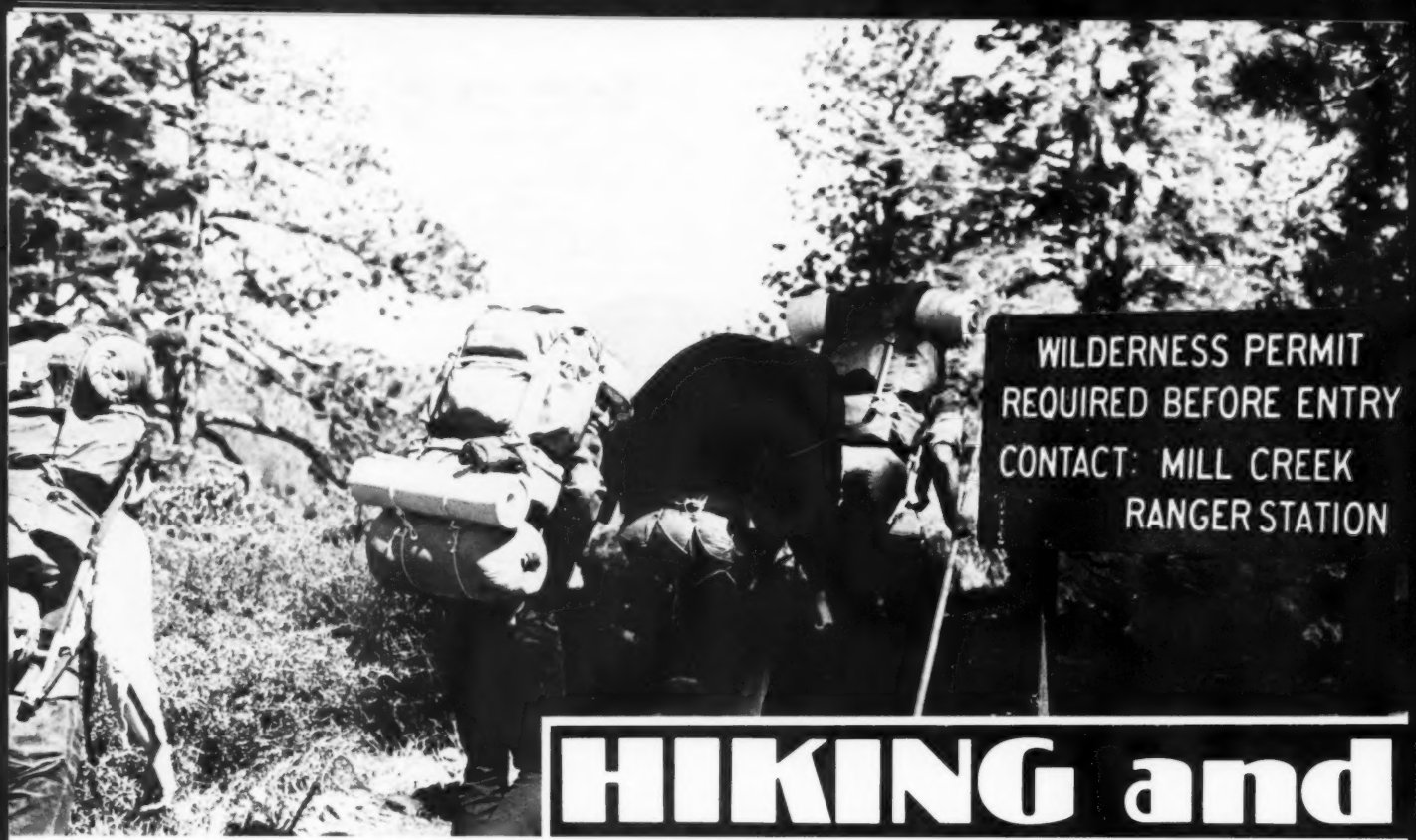
■ **"A seat belt will trap me in a burning or submerged car."** DOT advises us that the possibility of fire or submerging is almost nil. In fact they say, less than one-half of one percent of all accidents involve fire or submersion.

■ **"Well, I thought getting away from the car is better than staying with it in an accident."** As we pointed out in the answer to our first alibi, the purpose of a seat belt is to keep you in the car. Almost half (47%) of all traffic deaths occur specifically because the victim was thrown from, or through the car. The next three leading causes of death were impact with the door or side of the car, the steering column, and the instrument panel—with many of these caused because the victim was not restrained from hitting them.

■ **"It takes too much time and trouble to buckle up."** This is probably the second cheapest way out. Did you know that it takes more time to adjust the seat for proper driving position, or to adjust the rear view mirror? And it takes *much* longer to open a pack of cigaretts and light up. Of course if the belting system is new to the driver, or if it has to be readjusted after someone else has driven the car it might take a few seconds longer.

■ **"I've never had an accident, so why should I need to use seat belts?"** Like the fool who doesn't wear them because he doesn't expect to have an accident, our answer comes from a Jackson Browne song: "Don't think it won't happen just because it hasn't happened yet."

Excuses, excuses. Which one are you kidding yourself with?



HIKING and

If the government's habit of putting military bases near the edges of civilization is getting you down, consider that your solitary location might actually be a boon when it comes to recreation possibilities.

It's a good bet that if your base is not in or adjacent to a large metropolis, it just might be within a short drive of the mountains or one of the many National Parks and Forests set aside in the U.S., Canada, and nations abroad. If this is the case, opportunities for relaxation await both the beginning and experienced hiker and camper.

DRIVER is not advocating that you rush madly off into the hills or forest, because a stay in the wilds can be a dangerous matter if proper preparation and care are not taken beforehand. Instead, we would like to offer some helpful tips that will add enjoyment, comfort, and safety to your outing.

PLANNING

There's an old saying that "Getting there is half the fun." Planning your day hike or overnighter can be enjoyable, too.

A good place to start is in deciding where to go. You may have some ideas of your own, or your friends may have some suggestions, but if neither is the case, the people at the local Forestry Department Office or National Park Service are sure to have many helpful suggestions. Still other places that should know some of the local areas are sporting goods stores and recreational vehicle dealers.

Be sure to check with these places, and get maps of the area you plan to camp in. These are usually available at the local Forestry Office. Find out about the number and length of trails in the area, the types of terrain, and the availability of improvements such as water, stoves, campsites, Ranger Stations, etc.

In some states such as California, some National Forests and all special Wilderness and Primitive Areas require campground reservations, or a Wilderness Permit. Most campground reservations are about $2 per day for a hiking group, but can range as high as $40 per day for very large groups with campers and motorhomes.

Reservations are available through commercial ticket agencies, either in person or by mail, just the way you get tickets for sports events or concerts. Mail-in-requests are available at your local Forestry Service Office. Wilderness Permits are free and are issued at Ranger Stations and Forestry Service Field Offices near your point of entry, or they may be obtained by writing to the Wilderness you plan to visit.

Another thing you will want to check into is weather forecasting: how hot it gets in the day, how cold it gets at night, and the chance of rain or snow. Getting caught unprepared by a rain storm will not only put a damper on your outing, but can transform a dusty trail into a slippery, dangerous experience in mud.

Pilots and boaters are well-acquainted with flight and float plans, and campers and hikers should get in the habit of making out a trip plan, too. Telling a friend back home where, when, and for how long you are going takes only a few minutes but can save your life if you get lost or hurt on the trail. Also be sure to tell someone where you plan to camp, and which trails you intend to take into and out of the area. A copy of this information can be given to the local Ranger or Forestry official for added safety and peace of mind.

Going out alone into the mountains or forest is a move that you really ought to avoid. It's much harder to get lost if there is somebody along to say, "Hey, this isn't the way we came!" and an injured or lost person can seldom calm himself to the point where he can help his situation. Get a buddy or two, or 20, to go along. Camping and hiking with a group can be more fun than a good TDY, what with all the people to do things with and learn with.

"Ah huh," a few of you nonhikers and campers are probably thinking to yourselves right now, "It just may be a heck of a lot of fun, but doesn't equipment cost an arm and both legs?" That it

CAMPING

A good all-around boot for anything but the most strenuous hikes is the Vietnam combat boot. About $10.

does, but there's no reason in the world for you to avoid the outdoors just because you can't afford to buy equipment. Besides most sporting goods stores renting equipment, the Recreational Services Office on your base will have everything except clothing that you might need—and often for less than what the sales tax would be if buying new items.

Equipment at Rec Services is generally rented on a per day and weekend basis. Typical prices for some items you might want are:

sleeping bag	$1 day/$2 weekend
backpack	.75/$1.25
tent	$2/$4
air mattress	.25/.50
fuel stove	.50/$1
camp shovel	.10/.25
Ensolite pad	.25/.50

The advantages to be had by renting your equipment at Rec Services are obvious: you can get started with very little cash, you can find out what your individual needs and preferences are, you will have a source of seldom used but "nice to have" items, and you can find out if hiking and camping are for you—without having a closet full of equipment to haunt you in case it's not.

After several tries with rental equipment, you may decide to stick with the outdoor scene. It'll be about this time that you decide to start buying your own equipment, so we'd like to offer some helpful suggestions of what to look for when shopping.

BOOTS AND CLOTHING

What you wear on your feet will play a big part in determining how much fun you have on your outing. Comfortable, good-fitting footwear with good air circulation can make hiking a pleasure, but boots that don't fit right are guaranteed to cause painful blisters and sores.

Terrain and distance to be hiked will be the biggest factors in your decision of what footwear to take along. A simple, short, day hike or a weekend campout where no hiking is involved are good times to go with a heavy pair of canvas tennis shoes. Tennies are tops in comfort, are highly practical around camp, and are good for hikes in flat areas with little underbrush and rocks. The high-top versions are best, because they provide some degree of ankle support.

Most hikers, however, prefer to go with some form of a boot. The seven-inch variety with Vibram lug soles are the most popular, but they tend to be expensive. So unless you expect to really get into hiking and camping, you probably ought to stick to tennies and work shoes you may have around the house.

Leather is regarded as the best material for hiking boots because it wears well, is soft and pliable, and can be

continued

Seven-inch boots with Vibram lug soles are the most popular for hiking, but are unnecessary for easy overnighters and day hikes. Prices range up to about $60.

When picking outdoor clothing, go for items that are comfortable, durable and functional—Levis™ and long-sleeved flannel shirts are great. Jeans—$13, shirt—$3 to $15.

water-proofed against the rain and snow. Leather soles, though, are slippery, especially when water is involved. A good general-purpose boot, suitable for anything but heavy-duty, long-distance hikes, is the Vietnam combat boot. They are fairly light, are of tough nylon and leather construction with steel plates in the heel and toe, are well ventilated, and have a good sole for hiking.

In selecting a pair of boots, be sure that they fit comfortably over two pairs of socks—a thin cotton inner pair, and a heavy wool outer pair—and protect the ankle and give support to the foot. Boots, incidentally, should be broken in before the trip.

A few words of advice: cowboy boots are made for horseback riding and ski boots are made for skiing. Don't use them for something they weren't made for.

Clothing for the outdoors should be selected with weather and terrain in mind. Shorts and fish-net tops (go ahead if you like, ladies) are great when the weather is warm, but colder conditions definitely call for something more substantial. Whatever you wear, though, should be comfortable, durable and functional. It doesn't have to be the best of quality or the most expensive, but it should be good enough to meet the conditions of your outing. Go for clothing that will last and look good over a long period of time and is of practical design and sturdy construction.

For most outings, loose-fitting jeans are excellent, as are long sleeve flannel shirts (to keep the sun off your arms). Be sure to take along either a wool shirt, sweater, parka or wind breaker in case the weather changes, and at least one change of underwear and socks. If you have a tendency to burn, a wide-brimmed hat will be a nose-saver.

BACKPACKS

Packs have come a long way from the World War II versions, and have taken

The rucksack, or day pack, is perfect for short day hikes and casual overnighters. About $6.

Modern frame backpacks see most of the outdoor service today. This model is a good beginner's pack, and is fine for anything except long outings. About $25.

Packs for the hiking and camping enthusiast can become very large, and have many side and interior storage compartments. About $70.

Many frame backpacks come with padded shoulder straps, but if yours does not, they can be purchased separately. About $2.

much of the burden out of hiking. There are two main types of packs in camping use today: the rucksack, a simple frameless sack with shoulder straps used to carry light loads on day hikes and short overnighters; and the modern, frame backpack, a lightweight aluminum frame which is angled at the waist and shoulders to fit the contours of the body. Frame backpacks often come with large nylon sacks attached to them, with many interior and side storage compartments.

Frames are made to fit persons of most any size and weight, and have adjustable belts at the bottom called "belly bands." These straps allow the pack's weight to be shifted to the wearer's hips, and off his shoulders. If the belly band is released, the frame will hug the back so it doesn't swing a person off balance while he jumps from rock to rock, or hikes along a narrow ledge. Large shoulder strap pads can also be bought for the pack for only a few dollars, and are worth the investment.

Weight loads are a point that should be considered carefully. Overloading will tire a person quickly if he is not used to hiking, so beginners should keep their pack weights down. Women should carry no more than 30 pounds the first few times out, and men no more than 40. With experience, these limits can be extended to 40 and 50 pounds. Children should carry from one-third to one-half less, depending on the individual child's height, weight, age and physical condition.

FOOD

One of the most enjoyable parts of camping is the outdoor eating that goes with it, and unless the meals are interesting, varied and worth looking forward to, outdoor life won't be half as much fun as it can.

Camp meals should be loaded with calories, because you'll generally burn up more energy in the woods than you will back in town. They should also be varied and nutritionally balanced. The best foods for outdoor living are easy to carry, lightweight, compact for the amount of energy they provide, slow to spoil, and quick and easy to prepare. If you are backpacking more than just a few miles, you will want to avoid foods that are heavy and bulky, those that spoil rapidly, and those that require elaborate preparation. At a drive-in camp, though, such foods are to be considered, especially if a refrigerator is available.

Most of us are already familiar with the many instant drinks on the market, which also happen to be excellent for camping purposes. Tea, lemonade, coffee, cocoa, milk, and soup are just a few you might consider taking along. Other lightweight and easily prepared foods for the trail include many varieties of vegetables and instant mashed potatoes and rice. Dried fruit, raisins, and salami are things that really shouldn't be left behind, since they are both compact and loaded with energy. Nuts and candy are some other favorites.

continued

Brand or company names and products mentioned or pictured do not represent endorsement by DRIVER or the U.S. Air Force.

(above, below)
Recent developments in the process of freeze-drying make it possible to have exotic meals on the trail, such as beef almondine and most any vegetable desired.

Having a buddy check all your straps, harnesses, and weight distribution in your pack is a good idea before getting started.

Food companies have made tremendous improvements in the area of freeze-dried and instant foods, some even offering complete freeze-dried meals. Do a little shopping at grocery and sporting goods stores to see what is available, and pick what suits your tastes. Meat is not a problem on the trail because more and more varieties are being packaged in compact vacuum-sealed bags. Fresh eggs can provide a few problems, though. If you feel you must have them, buy the kind that come in stiff pressed cardboard or styrofoam containers. But if you'll settle for scrambled eggs, just break them into a rugged plastic zip-loc bag before you leave the house.

Canned food, if you don't mind the weight and the hassle of packing the cans out, will solve the matter of what you can and can't have to eat out on the trail. But they're very heavy.

FIRST AID KITS

Though people don't plan on it, some do get hurt on camping trips, even at the drive-in variety. So the wise outdoorsman won't want to get caught without some form of first aid. Kits can be as elaborate as you wish, but be sure that they at least contain bandaids, compresses, an Ace bandage, a triangular bandage, antiseptic, insect repellent, aspirin, adhesive tape, and mole skin for blisters. It's also a good idea to take along light-anywhere stick matches that you can waterproof by dipping in paraffin.

OTHER THINGS TO TAKE

A sleeping bag and some kind of a tent are probably among the first things that come to mind when the subject of camping comes up. Bags come in all shapes, sizes, and price ranges, so the type of camping you will be doing, and your own preference, will be the deciding factors when it comes time to choose one. Many people prefer the down "mummy" bag, which is the warmest, lightest, most compact, but most expensive. Summertime outings in low to medium elevations usually don't call for anything more than a common cotton quilted bag, though.

Many campers enjoy the comfort an air mattress provides, but if you would rather not spend your time blowing the silly things up, you can get an Ensolite pad—a foam rubberish material that when placed underneath a sleeping bag provides a heat-retaining cushion against the ground. If you want to rough it entirely, though, you can insure yourself a comfortable night's sleep by scooping out shallow depressions in the ground underneath where your head, shoulders, rearend and feet will lie. By filling these areas with dead leaves or pine needles, you can remove most of the discomfort that comes from sleeping on hard ground.

A tent is considered an option by many veteran campers, but you may like the idea of a roof over your head. There are many sizes and types of tents on the market—from 10-man canvas varieties with rooms in them, to one-man pup tents—so you'll have to decide for yourself what you want and can afford.

A good general purpose shelter to consider is the plastic "tube" tent. Consisting of a long cylindrical piece of heavy plastic, these tents are usually big enough for two adults to sleep end to end in, and are quite inexpensive. They are also easily pitched by using light cord, rocks, and two trees, or they make an excellent ground cloth if you decide a view of the stars is the way to go.

Some other things that are often taken

Nighttime out in the open calls for a sleeping bag, with the best being the down-filled "mummy" bag. Varies from $30 to $200, most about $65.

The cotton-quilted bag, though, is the industry standard, and is good for temperatures in the mild and medium cold range. Wide price range, with most about $40.

For sleeping on the ground, an Ensolite pad is a good buy, providing a heat-retaining cushion when placed underneath the sleeping bag. $3 to $5.

on campouts are a knife and axe for general camp use, a small coil of light rope, collapsible water containers, a whistle (three short blasts means you need help), and a flashlight with extra batteries. You should also take along a good compass and map of the area, but they won't do any good unless you know how to use them.

MAKING CAMP

In picking a place to camp, look for the availability of drinking water (be sure to get some water purification tablets just in case), fuel wood, elevated ground level (in case of rain), and protection from the wind. Hold out for a view if possible. Pitch your tent where it will catch the morning sun and dry out before you have to pack up. And be sure to note which way the wind will blow: from water to shore and down canyons at night; in reverse during the day. Be sure to avoid camping under trees that lean noticeably, or trees that have dead branches.

An open fire, though colorful and a part of the outdoor atmosphere, is banned in many areas during certain times of the year. Be sure to check with the local Ranger before making your trip. If you find they are allowed, care must be taken to build them carefully. Select an area clear of grass, brush, leaves, and gusty winds—preferably in sand, loose dirt, or on rock. Make a ring of medium-sized stones around the fire to further cut out wind action, and keep a pail of water nearby just in case it should get out of hand. Be sure to keep the fire small; it should never be bigger than you need to cook with. Also, be thorough in putting your fire out. First douse with water, then stir the ashes with a stick and mix with dirt, then douse again. Be sure to remove the rocks so your fire site will not mar the area's appearance for others.

OUTDOOR COURTESIES

If you are impressed with the unspoiled beauty of your camping area, it's probably because the campers there before you took the time to clean up after themselves. The goal every camper should try to attain is that he leave no sign he was ever there. This means burning all flammable garbage, burying organic material for decomposition, and *carrying* out the rest.

Wash water should never be poured back into a spring or creek, but should be taken away from camp and dumped on the ground. Before leaving a campsite, make an inspection of the area and remove anything that is unnatural to it —even if it was there when you arrived.

Only rarely will there be any toilets in the National Forests, so sanitation will be your personal responsibility. Nature has provided in the top six to eight inches of soil a system of very efficient biological decomposers for things such as fallen branches, leaves, animal droppings, etc. Thus, the individual "cat method" used by most experienced campers is recommended.

With a light digging tool, such as a garden trowel, pick a screened area at least 10 feet from the nearest water, and dig a hole about six inches deep and 10 inches wide. If there is any sod, try to remove it in one piece. After the deposit is made, cover tightly with soil and sod. Nature will do the rest in a few days.

Campers are popular people. They're so popular, in fact, that state, federal, and foreign governments maintain offices and agencies to answer their questions and to assist them in trip planning. Be sure to check with such places beforehand. Don't be afraid to ask questions. If you follow this helpful collection of tips, you're sure to have an enjoyable outing.

THE BACKYARD MECHANIC

TIRE CHANGE

We happened to be lurking around the Norton AFB Auto Hobby Shop the other day in our never-ending quest for the exciting and unusual, when we spied a young airman looking at the tire changing machine. By the look on his face it was clear that he didn't have the slightest idea of what he was looking at.

When we asked him why he was looking longingly at the tire machine he told us that he had a tubeless tire he needed to change, but that his local service station wanted $5.00 to swap tires, and he just didn't have the money.

Since we're the *last* people to want to see him running around on bald tires, we made a deal. We'd help him master the tire machine if he'd let us take some pictures for The Backyard Mechanic.

Now, a tire changer may not seem complicated or dangerous to some of you, but when we considered the number of tires we've seen ruined, and the number of fingers we've seen pinched, we decided that perhaps some of our less experienced readers could benefit from a short course in tire machines. Just follow along with the pictures, and maybe you'll save that five bucks for something more important . . . like a date!

1

As with all Backyard Mechanic activities, safety is foremost. The airman has blocked the wheels and is using a jackstand to support the car. After loosening the lug nuts while the wheel rested on the floor, he jacked the car up and removed the wheel.

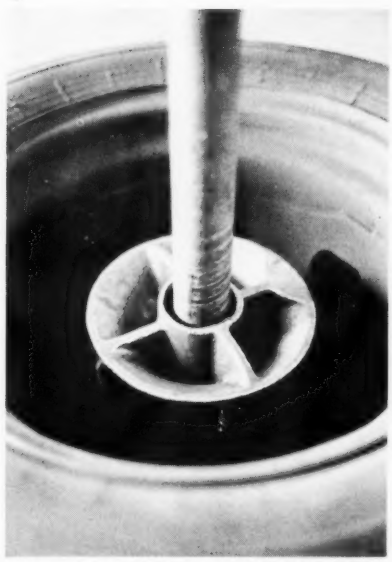
2

Using the special U-shaped wrench, remove the valve core from the tire valve. Use caution here because if you don't control the valve core, air pressure from the tire can force it up and out, straight at your face. Either wear safety goggles or stand well to the side of the tire. Now, remove the wheel balancing weights.

3

After the tire is deflated, place it on the tire machine table. The vertical shaft of the machine goes through the center of the wheel and the indexing pin goes into any bolt hole. The VW wheel shown here, and some GM and Ford 15-inch wheels must go on upside down. Most other wheels go on right side up. We'll explain in picture 5.

4



After the wheel's on the table, install the cone-shaped hold down nut. This nut both secures the wheel to the table, and centers the wheel on the machine. The cone should be installed hand tight, then hit a small lick with a brass or plastic hammer to snug it up.

5

This odd looking device is called the "bead-breaker." It's essentially a lever that forces the tire bead away from the wheel rim. Press down on the lever at 3 or 4 places around the wheel and the bead will separate from the rim. If you can't force the bead away, try turning the wheel over. Some wheels have too much offset (depth) for either the upper or lower bead breaker to work. Not turning the wheel over if you can't break a bead can cause younger mechanics to turn gray at an early age.

6

Same procedure as in picture 7 but breaking loose the other (bottom) bead. Again, if you can't break the bead, turn the wheel over.

continued

7.

Use a flat tire iron to get the bead lip on top of the rim. Then, use either a tire iron or this roller-and-tire iron device to force the entire bead on top of the rim. A little "goose grease" or liquid soap may help this process.

8.

Do the same with the lower bead, forcing it off the top of the rim. Your old, scruffy, worn-out tire should now be ready to throw in the junk pile.

9.

It's not always necessary, but if you've got the extra 25¢ you might consider installing a new valve. Just cut out the old valve, insert the new one from behind the rim, and pull it into position with the tire valve puller. A little lubrication will help here too.

10.

Take the new tire and lubricate it with liquid soap. Determine which side of the tire you want facing the street, and remember that you may have put the wheel on the tire machine upside down and the tire will have to be positioned accordingly.

11.

Install the tire by just basically reversing the removal steps. Use the roller tool or tire iron to force one bead at a time over the rim. A new tire will have a lot of space between it and the rim so you'll need a method of making the tire bead come near the rim so . . . .

12.

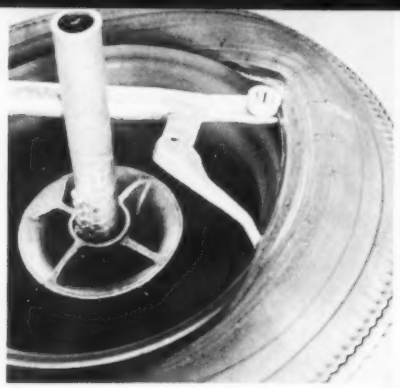
Ask the hobby shop supply for a tire band. This can be either a metal band with a crank, or a fabric coated rubber tube with a tire valve in it. Fit the band securely around the circumference of the tire and snug it up with the adjusting straps.

13.

Using the low-pressure (less than 50 PSI) air source, inflate the band till it forces the tire bead against the rim. If the bead still doesn't quite seat, close the valve on the band by turning it and gently tap the tire bead with a rubber hammer. Drip some liquid soap around the bead to help this process.

14.

With the bead seated to the rim, remove the tire band by deflating it, and put air in the tire to your cars' specs. Remove the air hose and let all the air run out, and install the new tire valve core. Again pump up the tire to the correct cold pressure, and put the tire in a nearby water tank shaped like a semicircle. Check along the bead and tread areas for bubbles indicating air leaks. If you don't have any bubbles, move on to the tire balancer, then reinstall the tire.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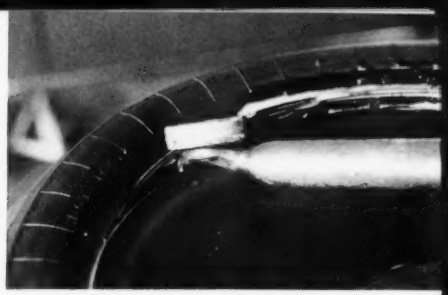
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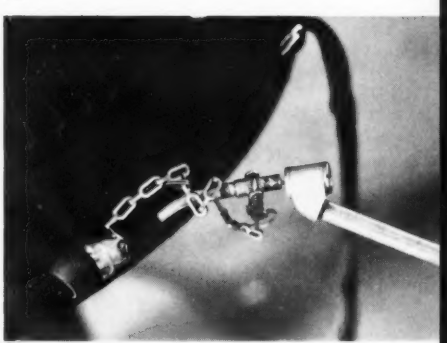
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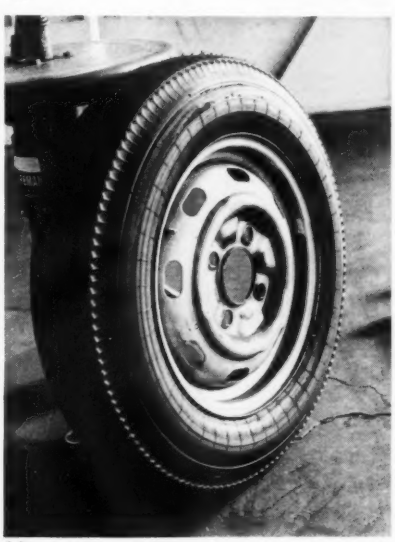
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TIMELY TOPICS

HOT TIP

If you look on page 29 of this issue, you'll see a message about how to keep your car's electrical system in top shape. However, there comes a time when you'll *need* a jump-start for the ol' buggy, no matter how well you care for the electrical system.

When the need arises, too many people tend to think that any jumper cable that can be stretched between two cars is a good cable to use . . . not so!

Modern automobiles require anywhere between 200 and 400 amps to crank over. Those aluminum, three-strand, crimped-connection cables available at your local discount store (and even in the Exchange) just can't deliver this kind of amperage rating. Those cheap-o cables will probably fry themselves (or you) before they'll pass 300 amps.

Do yourself a favor and buy a set of *good* copper cables with soldered connectors. They'll pass all the amps you need, and won't melt their insulation all over your shiny grille.

THE $140 OIL CHANGE

If you backyard mechanics decide to change the oil in your '75 Chevrolet . . . take care. Seems that if you use a hobby shop hoist that supports the car by the frame, you can cause the catalytic converter to go out to lunch. Even a floor jack, positioned improperly, can contact the converter before the frame and cause bends or breaks in the converter shell. Not only will this @#$%¢&* up the converter, it'll cause gas leaks . . . definitely not the hot set-up.

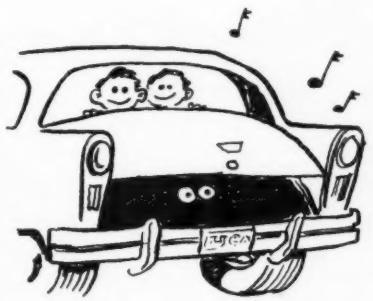
Take a little extra time and use 4-inch blocks on the lifting pads of the hoist or jack. This will give you clearance on the cat-con and save the cost of the $140 oil change.

RECALLS

Buick has recalled 19,000 fuel-injection-equipped *1975 Opels* for inspection of the air throttle valve.

Buick officials indicate the two screws which attach the air throttle valve to the throttle shaft may loosen, allowing the throttle valve to slide out of its proper position. This could result in a wide-open throttle after pressure is removed from the accelerator pedal.

Officials of *Volvo of America* are recalling 48,768 1975 and 1976 models to check for an improperly fitted vacuum hose that could leak potentially dangerous gasoline fumes. *Volvo* says no accidents have been attributed to the problem but has decided to recall based on the potential danger of the situation.



CB RIPOFFS

Latest attempt by the industry to prevent CB ripoffs from reaching major crime wave proportions is to remove temptation by hiding the radio or the antenna. Several manufacturers now offer motorized retracting antennas which operate at the push of a button. Another new development is the one-handed rig that places all the radio controls on a detachable mike. This lets you hide the radio almost anywhere and when you disconnect the mike, there's no evidence of a CB being installed.

DEFECTIVE CAR?

SOUND OFF!

Got a defect in your new car or truck you'd like to complain about to someone who'll listen? The Consumer Services Section of the National Highway Traffic Safety Administration has a toll-free number handling 30 to 150 complaints a day since it was set up on a trial basis a year ago for callers in 10 states.

In addition to new-car gripes, the office accepts calls from used-car buyers who, by giving the operator the make, model, and year, can learn if the car has been subject to a factory recall. The customer can then find out from the seller or manufacturer whether the defect has been repaired.

The most common complaints, NHTSA says, are about 1976 autos—all models—and concern prematurely worn disc brake pads and premature rusting.

The telephone number, 800/424-0123, may be called without charge in all of Connecticut, Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, and West Virginia; by New Yorkers in New York City, Long Island, Buffalo, and Rochester; and by Ohio residents with telephone area codes 513 and 614.

continued from page 2

DOUBLE CLUTCH

Turbine engines have low emissions, but fuel economy is poor. They may be good for long-distance trucks and buses.

The steam power plant keeps emissions low, with its combustion outside the cylinder. However, General Motors VP Robert D. Lund says it suffers from poor fuel economy and additional problems with water freezing, extremely high pressures, and high-temperature steam.

The Sterling engine is another power source that involves heating and cooling operations and is quiet. But it's heavy and involves complex sealing. And the working fluid can be quite hazardous.

GM has built several electric cars whose chief liabilities are that the battery still takes up too much space and the cruising range is limited. Lund does not see an all-electric vehicle system before the 1990s.

LETTERS TO THE EDITOR

BACKFIRE

Address your letters to:
Editor
DRIVER Magazine
AFISC/SEDD
Norton AFB CA 92409

POT AND DRIVING

I have just finished your article on pot and driving, August issue. I would like to offer some comments. I am in the USAF and have been for 3½ years. Two years ago I got popped for possession of pot. I have smoked it regularly for four years now.

Your article was informative but I don't agree with all you said. However, it's one of the better ones I've read. I am stationed in Arizona, the pot capital of the U.S. My daily habit consists of one joint before work, one at lunch, and one right after work. Then anywhere from two to five more before bed. My wife and I smoke an ounce each week. This is every day for the past four years. You might say I was "high" all the time.

Now let me tell you about my driving. I don't have a good record; several moving violations. But in each case, alcohol and emotions were involved. Not always pot. I have had no accidents but several near-misses. Of these, only once was I at fault. I went to change lanes and didn't look. Luckily for everybody, my wife did.

Aside from that, your article is pretty true. I don't have recognition trouble. I see what is there. I tend to overlook things as a result of being high, but if I look, I see. I don't mistake one thing for another. I don't see colors or anything like that. There does seem to be a reaction delay, but not always. In the car I drive slower, but I drive the bike (750 Honda) the same whether high or not. I drive a car more fluid when high. Easy starts and gradual stops. But I do that in deference to the $1,000 invested in my '66 Chevy Impala. I've had the drive train, suspension/steering, and brakes/tires repaired or rebuilt to make my car as safe, solid, and road-worthy as it was when it was new.

The biggest effect of pot on driving is in the concentration department. Sometimes my mind wanders off and so does the car. I get drifty. So to counter that, I think extra hard about what's going on in my driving. Also I eliminate any distractions, i.e., radio music, people talking. Also, I limit myself and don't mix drinking and smoking. Usually I just stay home, let someone else drive, or take the back roads.

I don't know what pot does to you physically. I think a person can control a high mentally to the extent of becoming straight. Pot has affected my memory in that it is not as sharp as it was. I can't recall the detail I once could. I don't know if that will fix itself if I stop smoking. Now and then I notice my speech slurring, but that's when I'm really loaded to the max.

I don't think everybody ought to smoke pot. If you can't take it – leave it alone! Those people that turn up the music and push down the gas are going to meet justice, be it a cop or an accident. The pot high is relative to the person and his state of mind. I, for one, enjoy it.

unsigned

Reference your August article about pot, I would like to point out a poorly phrased statement which may indicate a misleading perception.

I am a member of the Social Actions Office at Williams AFB, NCOIC Drug/Alcohol Section. It is my impression after reading in your article, "It's a confidential program . . . " that you think the program is totally confidential. I would like it made known that Air Force Social Actions Drug/Alcohol counselors do not have total confidentiality. The only member of the Air Force I'm aware of who does is the chaplain.

We certainly strive to keep information as confidential as possible, but in effect we do not have total confidentiality.

SSgt John H. Farrar
82 FLYTNG WG
Williams AFB, AZ 85224

You're quite right about the Air Force's interpretation of the program; it's not strictly confidential. DOD calls it a Limited Privilege Communication Program (LPCP) and some social actions people have interpreted that to mean "confidential." If you're a drug user and have any doubts about voluntarily talking to some one, we suggest you ask what your rights are before you discuss your problem.

The same article also stated that some military pot smokers are identified for rehabbing through DOD's urinalysis program. That's true, but only indirectly. The urine tests detect other drugs, not marijuana. But once a user has been identified he or she usually also admits to having used pot.

WHAT'S A WAVE?

In your August issue, Miss DRIVER is said to be a WAVE, U.S. Navy. The organization known as WAVES existed in the U.S. Navy from 1942 until the signing of Public Law 625 of 1948 by President Harry Truman. That law integrated women into the regular Navy.

Many men and women who are in the Navy now take offense at the terms WAVE or WAVES. At best the terms are inaccurate. They can be insulting or used to separate women from "regular" Navy Personnel. Surely Air Force personnel should not be referred to as members of the Army Air Corps, a change that took place in the same decade.

It would be appropriate to refer to members of the military services in proper military terms which could not be taken as disparaging. By the way, WAVES was an acronym for Women Accepted for Volunteer Emergency Services. What is the term WAVE an acronym for?

FTGC J. Campbell, USN
Norfolk, VA 23509

Claudia Mahin referred to herself as a WAVE in her biographical sketch and we thoughtlessly did the same when describing her in the magazine. Our apologies. We not only should know better, we do.

ZAP

ELECTRICAL PROBLEMS ZAPPING YOU?

If you're having problems with slow starting, low battery charging, headlight flare, ammeter fluctuation, or starter relay clicking, don't run right out and buy a new battery.

Champion Spark Plug Co. says that the majority of the problems listed above stem from bad connections or corrosion rather than a bad battery.

If your battery looks like the picture here, get busy. Chances are that the other components of the electrical system are in the same shape.

Clean battery terminals and check for corrosion at the cable ends. Check integrity (tightness) of all connections such as battery-to-solenoid, solenoid-to-starter, battery-to-ground, or starter relay-to-starter.

Also check loose starter motor relay mounting screws and snap-on solenoid connections.

Remember, physically tight isn't always electrically tight. Clean, dry, connections can solve a lot of problems.